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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/693,117	10/20/2000	Lynn David Bollinger	03371-P0005A LHR	7816

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EXAMINER

WILCZEWSKI, MARY A

ART UNIT PAPER NUMBER

2822

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/693,117

Applicant(s)
Bollinger et al.

Examiner
Mary Wilczewski

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE THREE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Aug 8, 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-22 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on Dec 11, 2000 is/are a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 12 6) ☐ Other:

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DETAILED ACTION

This Office action is in response to Amendment C filed on August 8, 2003.

Drawings

The formal drawings filed on December 11, 2000, are acceptable.

Response to Amendment

The amendment filed August 8, 2003, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: The estimation of the temperature difference across the middle layer as approximately $1/2(\Delta T/2)$. This was clearly not in the abstract, specification, or drawings of the application as originally-filed. (In the originally-filed specification, the temperature difference across the middle layer was given as $\Delta T/2$.) Consequently, the change to the the temperature difference across the middle layer, changes equations 15 and 17. An amendment to correct an obvious error does not constitute new matter where one skilled in the art would not only recognize the error, but also the appropriate correction. In re Oda 170 USPQ 268 (CCPA 1971). However, Applicants have not shown that the error in defining the temperature difference across the middle layer was an obvious error, rather, Applicants have argued that these changes do not introduce *materially significant* new matter. The legal

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standard is whether or not the person of ordinary skill in the art would have thought the inventors had possession of the added subject matter at the time of filing. In the previous Office action, Applicant was invited to show that the amendments to the specification merely corrected mathematical errors and did not introduce new matter into the originally-filed specification. A sufficient showing has not been made, hence, the amendment filed August 8, 2003, is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure.

Claim Rejections - 35 USC § 112, First Paragraph

The rejection of claim 3 under 35 U.S.C. 112, first paragraph, is withdrawn in light of the amendment to claim 3.

Claim Rejections - 35 USC § 112, Second Paragraph

The rejection of claim 7 under 35 U.S.C. 112, second paragraph, is withdrawn in light of the amendment to claim 7.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is unclear in claim 1 as to what is meant by *effectively* moving the substrate.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4, 5, 6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siniaguine et al., WO 97/45856, cited by Applicants.

Siniaguine et al. disclose a method for rapid thermal processing of a substrate in which a substrate is moved through a hot gas stream at a velocity which results in a temperature differential formed throughout the thickness of the substrate, see the abstract and pages 4-10. It is noted that the claims merely require the temperature of the hot gas stream to be "substantially above" the substrate surface temperature, but do not expressly recite any specific temperatures. It is apparent from the mathematical equations in the Siniaguine et al. patent that the temperature of the gas stream is higher than the substrate surface temperature. Since the temperature of the gas stream used in the method of Siniaguine et al. is higher than the substrate surface temperature, the instant claims are not deemed to patentably distinguish the claimed method from that of Siniaguine et al.

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Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siniaguine et al. as applied to claim 1 above, and further in view of Siniaguine, WO 97/45862, cited by Applicants.

Siniaguine et al. is applied as above. Siniaguine et al. lack anticipation only of using a substrate holder of the non-contact vortex type. Siniaguine 97/45862 disclose a non-contact vortex holder for wafer-like substrates which avoids physical contact between the wafer-like substrate and the holder thereby eliminating mechanical stress on the substrate while it is being held. Siniaguine further discloses that the holder is particularly suited for use in apparatuses using a reactive gas generated by an electrical discharge, see pages 1, 2, and 11. Therefore, in light of the disclosure of Siniaguine, it would have been obvious to one skilled in the art that the substrate holder of Siniaguine could have been used in the known method of Siniaguine et al. to prevent any mechanical stress to the substrate while it is held.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Siniaguine et al. as applied to claim 1 above, and further in view of Zorina et al., U.S. Patent 5,474,642, cited by Applicants.

Siniaguine et al. is applied as above. Siniaguine et al. lack anticipation only of the power density of the hot gas stream. Zorina et al. disclose an apparatus for treating a substrate with a hot gas stream, see the abstract and Figures 1 and 6. Zorina et al. disclose that the apparatus can be operated at a power density of approximately 10^7 W/m², see column 2, lines 30-50. Since the apparatus of Zorina et al. is similar to that of Siniaguine et al., it would have been obvious to one

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skilled in the art that the power density of the gas stream used in the apparatus of Zorina et al. could have been used in the operation of the apparatus of Siniaguine et al.

Allowable Subject Matter

Claims 11-22 are allowable over the prior art of record.

Claims 3, 9, and 10 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Response to Arguments

Applicants' arguments filed August 8, 2003, have been fully considered but they are not persuasive. Applicants have argued that there is no disclosure in Siniaguine et al. that would support a teaching of a temperature differential throughout the thickness of the wafer. Rather, Applicants argue that the method of Siniaguine et al. calculates a temperature differential in a direction *along the surface of the wafer*. However, on page 4 of Wo 97/45856, Siniaguine et al. disclose that a silicon wafer having a thickness of about 1mm has a *temperature distribution* in volume due to high heat conductivity and that it is cooled by convectional heat transfer to ambient gas from both sides of the wafer. This teaching clearly meets the limitations of claim 1 as to "establishing a temperature differential throughout the thickness of the substrate to enable the substrate to produce enhanced cooling...by thermal conduction into the bulk of the substrate...". Applicants have incorrectly argued that there is no temperature distribution throughout the thickness of the wafer as evidenced by the statement of Siniaguine et al. that the wafer has a uniform temperature distribution in volume. Siniaguine et al. has not disclosed that the wafer has a uniform temperature throughout its volume, as argued by Applicants. Rather, Siniaguine et al. disclose that a uniform range of temperatures, that is, a temperature distribution, exists throughout the volume of the wafer due to the uniform heating of the surface of the substrate. It is maintained that Siniaguine et al. teach a method for rapid thermal processing of a wafer in which a temperature gradient is formed throughout the volume of the wafer and cooling is produced by thermal conduction. It is maintained that the present claims do not patentably distinguish the

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claimed method from the prior art method of Siniaguine et al. For the same reasons, the rejection of claims 2 and 7 is maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Wilczewski whose telephone number is (703) 308-2771.



M. Wilczewski
Primary Examiner
Tech Center 2800

MW
November 2, 2003